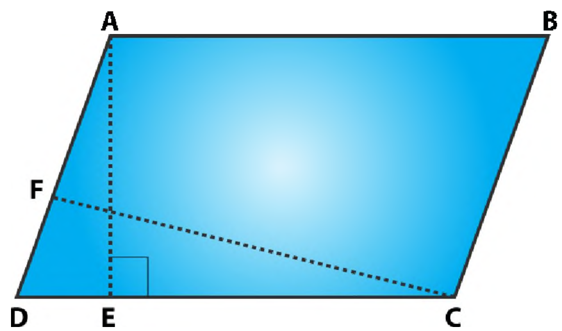
Solutions for Class 9 Maths Chapter 15 Area of Parallelogram and Triangles

Exercise 15.2

Question 1: If figure, ABCD is a parallelogram, AE ⊥ DC and CF ⊥ AD. If AB = 16 cm, AE = 8 cm and CF = 10 cm, find AD.



Solution:

In parallelogram ABCD, AB = 16 cm, AE = 8 cm and CF = 10 cm

Since, opposite sides of a parallelogram are equal, then

AB = CD = 16 cm

We know, Area of parallelogram = Base x Corresponding height

Area of parallelogram ABCD:

CD x AE = AD x CF

16 x 18 = AD x 10

AD = 12.8

Measure of AD = 12.8 cm

Question 2: In Q.No. 1, if AD = 6 cm, CF = 10 cm and AE = 8 cm, find AB.

Solution: Area of a parallelogram ABCD:

From figure:
AD × CF = CD × AE

6 x 10 = CD x 8

CD = 7.5

Since, opposite sides of a parallelogram are equal.

=> AB = DC = 7.5 cm

Question 3: Let ABCD be a parallelogram of area 124 cm^2. If E and F are the mid-points of sides AB and CD respectively, then find the area of parallelogram AEFD.

Solution:
ABCD be a parallelogram.
Area of parallelogram = 124 cm^2 (Given)

Consider a point P and join AP which is perpendicular to DC.

Now, Area of parallelogram EBCF = FC x AP and

Area of parallelogram AFED = DF x AP

Since F is the mid-point of DC, so DF = FC

From above results, we have

Area of parallelogram AEFD = Area of parallelogram EBCF = 1/2 (Area of parallelogram ABCD)

= 124/2
= 62

Area of parallelogram AEFD is 62 cm^2.

Question 4: If ABCD is a parallelogram, then prove that

ar(Δ ABD) = ar(Δ BCD) = ar(Δ ABC)=ar(Δ ACD) = 1/2 ar(||^{gm} ABCD)

Solution:
ABCD is a parallelogram.

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When we join the diagonal of parallelogram, it divides it into two quadrilaterals.
Step 1: Let AC is the diagonal, then, Area (ΔABC) = Area (ΔACD) = 1/2(Area of ll^{gm} ABCD)

Step 2: Let BD be another diagonal

Area (ΔABD) = Area (ΔBCD) = 1/2(Area of ll^{gm} ABCD)

Now,
From Step 1 and step 2, we have

Area (ΔABC) = Area (ΔACD) = Area (ΔABD) = Area (ΔBCD) = 1/2(Area of ll^{gm} ABCD)

Hence Proved.